

COOPERATIVE FIELD STUDY
PREVENTIVE SPRAY EVALUATION OF
CARBARYL FOR PROTECTION OF PONDEROSA
PINE FROM ATTACK BY IPS LECONTEI SWAINE

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INTRODUCTION

Pine engraver beetles of the genus Ips kill many tops and entire stems of ponderosa pine in Arizona and New Mexico every year. Of special concern is the loss of high-value trees at homesites or in developed recreation areas.

In the past, the use of lindane has been recommended as a treatment to protect pines from attack by Ips beetles (Anon. 1968).^{1/} As lindane became more expensive and less available, an effort was mounted to identify substitutes to the use of lindane for bark beetle control.

Recently, Smith et al.^{2/} demonstrated that a 2 percent carbaryl solution was effective in preventing attacks by mountain pine beetle, roundheaded pine beetle, and western pine beetle on ponderosa pine, and mountain pine beetle on lodgepole pine. Ragenovich and Coster^{3/} showed that carbaryl provided protection of loblolly pine from attack by Ips grandicollis Eichoff and Ips calligraphus Germar.

A project was initiated to assess the efficacy of carbaryl as a preventive spray against Ips in 1978 near Crown King, Arizona, on the Prescott National Forest (Fig. 1), where an infestation of Ips lecontei Swaine was active.

METHODS

On July 6, 1978, five clusters of 13 ponderosa pines per cluster were selected for the evaluation near the Kentuck Campground (TLON, RLE, Sec. 28). Five trees per cluster were marked for treatment with 1 percent carbaryl, five for treatment with 2 percent carbaryl, and three to serve as untreated checks. The 1 percent, 2 percent, and untreated check trees were interspersed to provide an equal infestation pressure. Newly infested bolts were placed at the base of all cluster trees to attract beetles.

^{1/} Anon. 1968. Suggested guide for the use of insecticides to control insects affecting crops, livestock, households, stored products, forests, and forest products. Agr. Handbook No. 331.

^{2/} Smith, R. H., G. C. Trostle, and W. F. McCambridge. 1977. J. Econ. Entomol. 70:119-25.

^{3/} Ragenovich, I. R., and J. E. Coster. 1974. J. Econ. Entomol. 67:763-5.

CROWN KING RANGER DISTRICT PRESCOTT NATIONAL FOREST

ARIZONA

1972

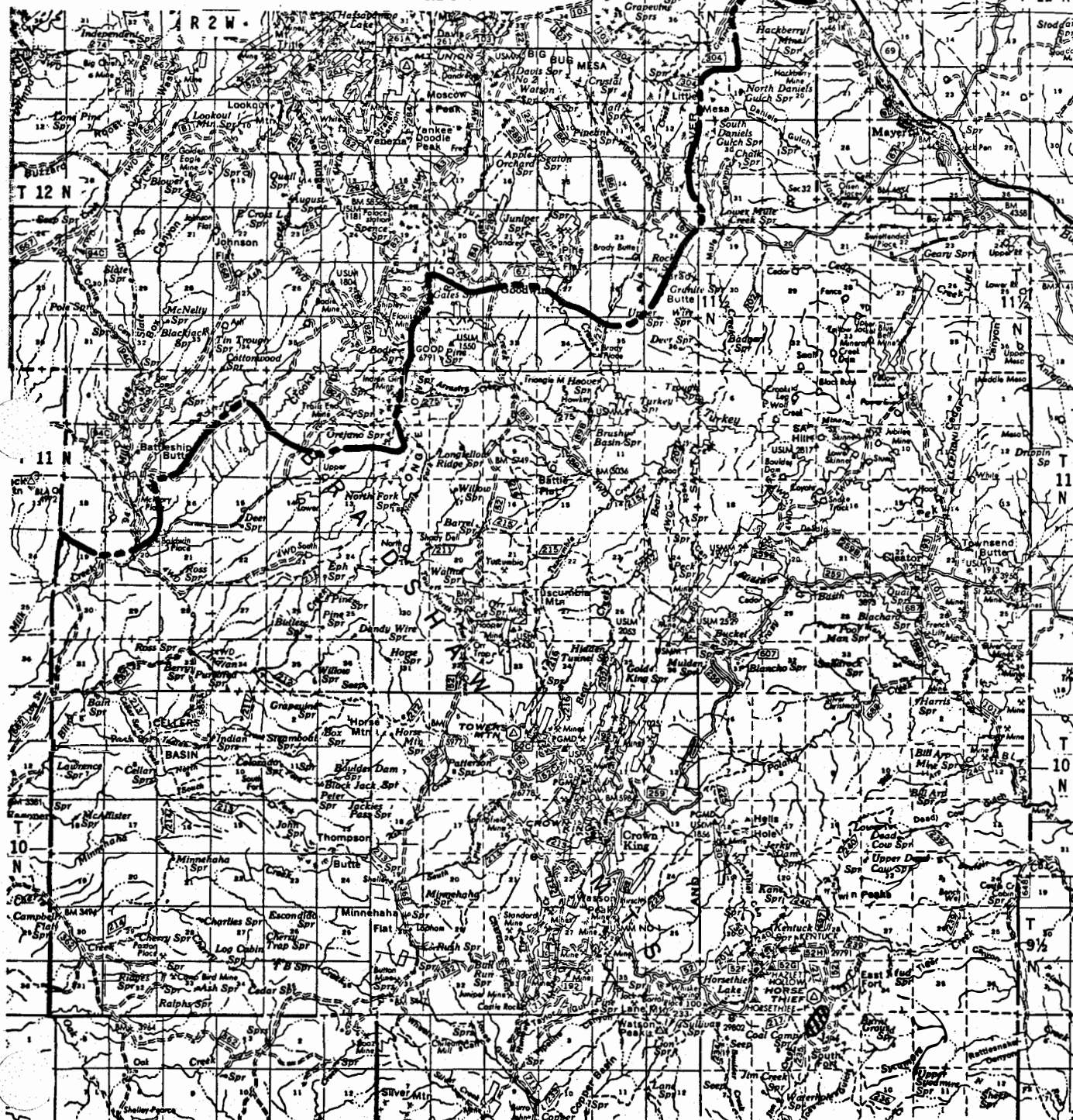
Scale

1 1/2 0 1 2 3 4 5 Miles

LEGEND

----- Ranger District Boundary

/// - Treated area



Spray formulations were prepared as follows:

2 Percent Mix

294 quarts water
13 quarts Sevimol (R) $4\frac{1}{4}$ /
2 quarts vinegar

1 Percent Mix

296 quarts water
6.5 quarts Sevimol (R) 4
2 quarts vinegar

Carbaryl treatment trees were sprayed the morning of July 6, 1978, using a Bean Model 1010 high-pressure hydraulic sprayer. All 1 percent trees were treated first and 2 percent trees treated second. Trees were sprayed to the top or as high as the spray could effectively reach.

RESULTS

Both the 1 and 2 percent carbaryl treatments appeared to provide protection from attack by Ips beetles. Four of the clusters had no attacks in either the treated or untreated trees; however, one of the clusters was in the middle of a spot of 30 Ips-killed trees. All of the check trees in this spot were killed, while two treated trees--one 1 percent and one 2 percent--were attacked at their tops above spray height. The treated trees were the only ponderosa pines still alive within the spot.

CONCLUSIONS

Both 1 percent and 2 percent carbaryl treatments adequately protected ponderosa pine from attack by Ips lecontei. Until further studies are done to delineate the length of protection afforded by the spray, a 2 percent carbaryl treatment is recommended for registration. It is essential that the entire bole be thoroughly treated to insure complete protection.

4/ This publication reports project results only. Mention of a proprietary product or pesticide does not constitute an endorsement or recommendation by the USDA

Forest Pest Control Publications

Pesticides used improperly can be injurious to man, animals, and plants. Follow directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key--out of the reach of children and animals--and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.